4316A
16,384 BIT STATIC MOS READ ONLY MEMORY

Organization: 2048 Words x 8 Bits
Access Time: 850 ns Max.

- **Single +5 Volts Power Supply Voltage**
- **Directly TTL Compatible — All Inputs and Outputs**
- **Low Power Dissipation of 31.4 μW/Bit Maximum**
- **Three-State Output — OR-Tie Capability**
- **Fully Decoded — On Chip Address Decode**
- **Interface to 4004/4040 CPU Via 4008/4009 or 4289 Standard Memory Interface**
- **Standard Operating Temperature Range of 0° to 70°C**
- **Also Available with -40° to +85°C Operating Range**

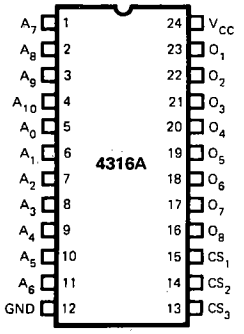
The Intel® 4316A is a 16,384-bit static MOS read only memory organized as 2048 words by 8 bits. This ROM is designed for microcomputer memory applications where high performance, large bit storage, and simple interfacing are important design objectives. It can be used in MCS-40™ systems via the 4008/4009 or 4289 Standard Memory Interface components.

The inputs and outputs are fully TTL compatible. This device operates with a single +5V power supply. The three chip select inputs are programmable. Any combination of active high or low level chip select inputs can be defined and the desired chip select code is fixed during the masking process. These three programmable chip select inputs, as well as OR-tie compatibility on the outputs, facilitate easy memory expansion.

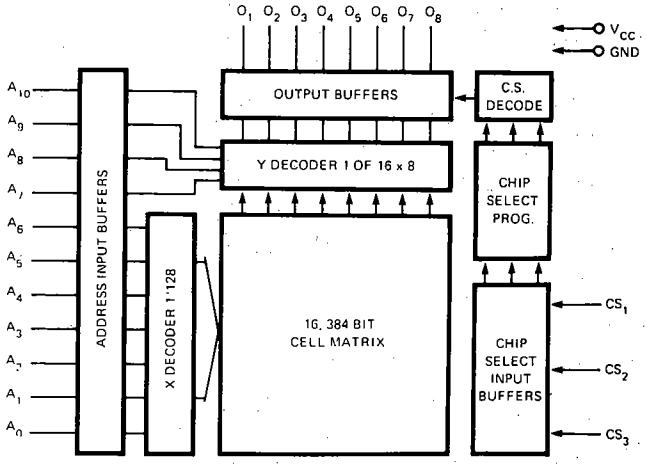
The 4316A read only memory is fabricated with N-channel silicon gate technology. This technology provides the designer with high performance, easy-to-use MOS circuits. Only a single +5V power supply is needed and all devices are directly TTL compatible.

MCS 4/40

PIN CONFIGURATION



BLOCK DIAGRAM



PIN NAMES

A_0-A_{10}	ADDRESS INPUTS
O_1-O_8	DATA OUTPUTS
CS_1-CS_3	PROGRAMMABLE CHIP SELECT INPUTS

Absolute Maximum Ratings*

Ambient Temperature Under Bias . . . . . 0°C to 70°C
Storage Temperature . . . . . −65°C to +150°C
Voltage On Any Pin With Respect
To Ground . . . . . −0.5V to +7V
Power Dissipation . . . . . 1.0 Watt

*COMMENT: Stresses above those listed under "Absolute Maximur Ratings" may cause permanent damage to the device. This is a stres rating only and functional operation of the device at these or an other conditions above those indicated in the operational sections o this specification is not implied. Exposure to absolute maximum ratin conditions for extended periods may affect device reliability.

D.C. and Operating Characteristics

T_A = 0°C to +70°C, V_{CC} = 5V ±5% unless otherwise specified

SYMBOL	PARAMETER	LIMITS			UNIT	TEST CONDITIONS
		MIN.	TYP.(1)	MAX.		
I_{LI}	Input Load Current (All Input Pins)			10	µA	V_{IN} = 0 to 5.25V
I_{LOH}	Output Leakage Current			10	µA	CS = 2.2V, V_{OUT} = 4.0V
I_{LOL}	Output Leakage Current			−20	µA	CS = 2.2V, V_{OUT} = 0.45V
I_{CC}	Power Supply Current		40	98	mA	All inputs 5.25V Data Out Open
V_{IL}	Input "Low" Voltage	−0.5		0.8	V	
V_{IH}	Input "High" Voltage	2.0		V_{CC}+1.0V	V	
V_{OL}	Output "Low" Voltage			0.45	V	I_{OL} = 2.0 mA
V_{OH}	Output "High" Voltage	2.2			V	I_{OH} = −100 µA

(1) Typical values for T_A = 25°C and nominal supply voltage.

MCS 4/40

A.C. Characteristics

T_A = 0°C to +70°C, V_{CC} = +5V ±5% unless otherwise specified

SYMBOL	PARAMETER	LIMITS			UNIT
		MIN.	TYP.(1)	MAX.	
t_A	Address to Output Delay Time		400	850	nS
t_{CO}	Chip Select to Output Enable Delay Time			300	nS
t_{DF}	Chip Deselect to Output Data Float Delay Time	0		300	nS

CONDITIONS OF TEST FOR A.C. CHARACTERISTICS

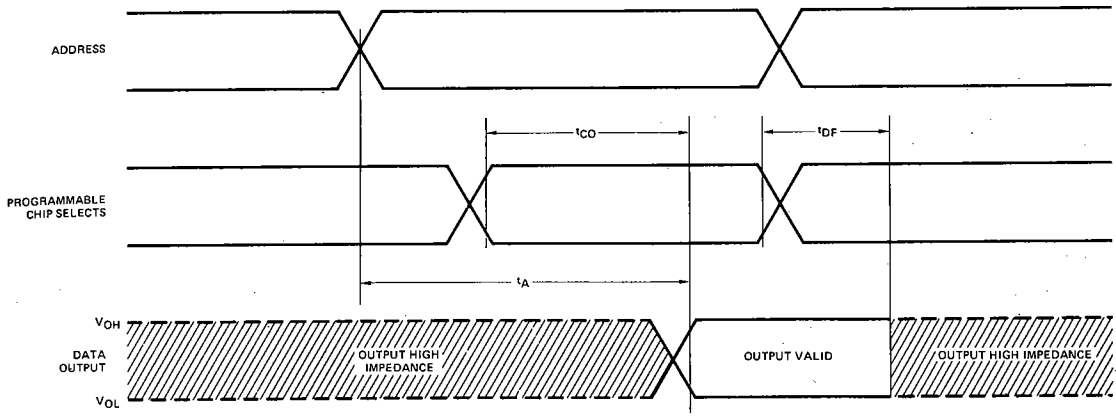
Output Load . . . 1 TTL Gate, and C_{LOAD} = 100 pF
Input Pulse Levels . . . . . 0.8 to 2.0V
Input Pulse Rise and Fall Times . (10% to 90%) 20 nS
Timing Measurement Reference Level
Input 1.5V
Output . . . . . 0.45V to 2.2V

Capacitance(2) T_A = 25°C, f = 1 MHz

SYMBOL	TEST	LIMITS	
		TYP.	MAX.
C_{IN}	All Pins Except Pin Under Test Tied to AC Ground	4 pF	10 pF
C_{OUT}	All Pins Except Pin Under Test Tied to AC Ground	8 pF	15 pF

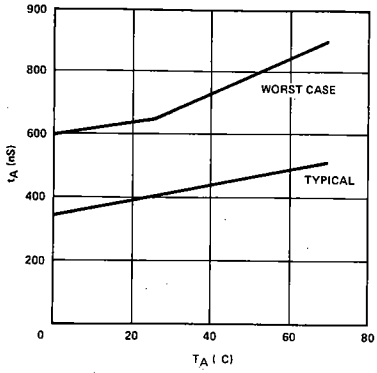
(2) This parameter is periodically sampled and is not 100% tested.

Waveforms

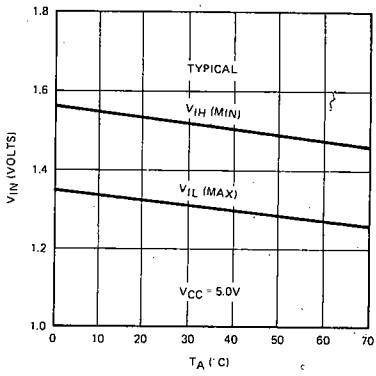

ADDRESS
PROGRAMMABLE CHIP SELECTS
DATA OUTPUT
V_{OH}
V_{OL}
t_{CO}
t_{DF}
t_A
OUTPUT HIGH IMPEDANCE
OUTPUT VALID
OUTPUT HIGH IMPEDANCE

Typical D.C. Characteristics

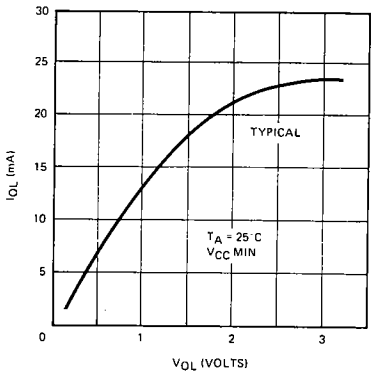
ACCESS TIME VS. AMBIENT TEMPERATURE



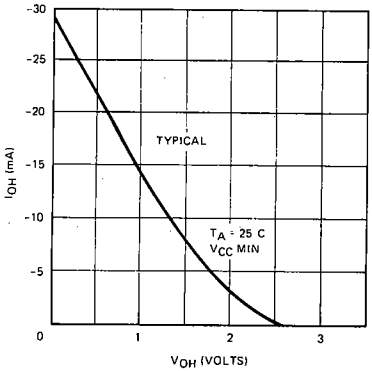
V_{IN} LIMITS VS. TEMPERATURE



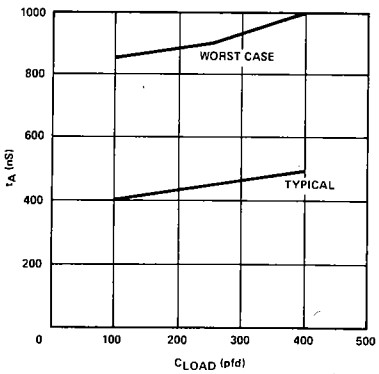
OUTPUT SINK CURRENT VS. OUTPUT VOLTAGE



OUTPUT SOURCE CURRENT VS. OUTPUT VOLTAGE



ACCESS TIME VS. LOAD CAPACITANCE



STATIC I_{CC} VS. AMBIENT TEMPERATURE WORST CASE